

REMARKS

Reconsideration and withdrawal of the present application in view of the foregoing amendments and following remarks are respectfully requested.

By this Amendment, the specification and claims 1-5 and 7 are amended. Support for the amendment to claims 1-5 and 7 can be found, for example, in page 11, lines 16-27, page 12, lines 1-13, page 14, lines 1-22, page 16, lines 2-19, page 19, lines 9-19, page 20, lines 20-27, and page 21, lines 20-27 of the specification and in FIGS. 2 and 7 of the present application. No new matter has been added. After entry of this Amendment, claims 1-8 will remain pending in the present patent application.

I. **Specification**

The disclosure was objected to because of an informality noted in the Office Action. In response, the heading "BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING" has been changed to "BRIEF DESCRIPTION OF THE DRAWINGS", in accordance with the Examiner's suggestion. Accordingly, reconsideration and withdrawal of the objection to the disclosure are respectfully requested.

II. **Claim Rejections – 35 U.S.C. §112**

Claims 1-8 were rejected under 35 U.S.C. §112, second paragraph. The rejection is respectfully traversed.

In connection with the rejection of claim 1, the Examiner alleged that the language "when outputting a read signal...from the disk medium is suppressed" is misdescriptive. In response, claim 1 has been amended to remove this language.

With regard to claim 2, the language "linear response dynamic range" has been removed from the claim to overcome the rejection. Claim 2, as amended, recites a read head element that is configured to have a linear magnetic field response in a range that is larger than an average value of the reproduction magnetic field from the disk medium.

With regard to claim 3, the language "saturation response dynamic range" has been replaced with "a maximum magnetic field value at which the output voltage starts saturating with increased input magnetic field strength". It is respectfully submitted that the amendment to claim 3 obviates the rejection.

With regard to claim 4, this claim has been amended to positively recite that the "maximum value" corresponds to the "maximum magnetic field value at which an output

voltage starts departing the linear magnetic field response". It is respectfully submitted that the amendment to claim 4 obviates the rejection.

Similarly, claim 5 has been amended to positively recite that the maximum magnetic field is created by the magnetic flux that comes from the disk medium. It is also respectfully submitted that the amendment to claim 4 obviates the rejection.

With regard to claim 7, the Examiner alleged that the phrase "the longitudinal bias for determining an operating point" lacks antecedent basis. In response, claim 7 has been amended to positively recite that "the read head element includes a hard magnetic film configured to generate a longitudinal bias, a direction of the longitudinal bias for determining an operating point of the read head element being in the same direction as a magnetic field received from the bias magnetic field applying layer." Support for the amendment to claim 7 may be found in page 21, lines 20-27 of the specification of the present application. Applicant notes that the amendment to claim 7 obviates the rejection.

Accordingly, reconsideration and withdrawal of the rejection of claims 1-8 under 35 U.S.C. §112, second paragraph, are respectfully requested.

III. Claim Rejections – 35 U.S.C. §102

Claims 1-8 were rejected under 35 U.S.C. §102(b) based on Akiyama *et al.* (U.S. Pat. No. 5,815,342) ("Akiyama"). The rejection is respectfully traversed.

Claim 1 is patentable over Akiyama at least because this claim recites a perpendicular magnetic recording type disk drive comprising, *inter alia*, a giant magnetoresistive element configured to have a linear magnetic field response characteristic, in response to a reproduction magnetic field from the disk medium, to output a signal waveform without distortion. Akiyama does not describe a disk drive including this feature. Therefore, Akiyama does not describe each and every feature recited by claim 1 and, as a result, cannot anticipate claim 1.

Akiyama discloses an apparatus comprising perpendicular magnetic recording media and magnetic heads. (See col. 6, lines 46-52) Akiyama also discloses that the shifting of the magnetic domain wall of the soft magnetic back layer 22 can be suppressed without influencing the recording magnetization of the perpendicular magnetic anisotropic layer 23, thus suppressing the generation of Barkhausen noise due to the abrupt shift of the magnetic domain wall. (See col. 7, lines 53-59).

Akiyama is, however, silent about a giant magnetoresistive element configured to have a linear magnetic field response characteristic, in response to a reproduction magnetic

field from the disk medium, to output a signal waveform without distortion. Moreover, as best understood, none of the references of record cure the deficiency of Akiyama noted above. As such, none of the references of record, whether alone or in reasonable combination, can be construed to render claim 1 unpatentable.

Claims 2-8 are patentable over Akiyama by virtue of their dependency from claim 1 and for the additional features recited therein. Applicant notes, with regard to claim 7, that Akiyama is also silent about a read head element that includes a hard magnetic film configured to generate a longitudinal bias magnetic field, a direction of the longitudinal bias for determining an operating point of the read head element being in the same direction as a magnetic field received from the bias magnetic field applying layer. In particular, Akiyama does not teach or suggest that the bias magnetic field is applied from a bias magnetic field applying layer of the disk medium to the GMR element. Akiyama only discloses that the bias-field applying layer 25 is configured to apply a bias magnetic field to the soft magnetic field layer 22 of the disk medium. (See col. 10, lines 14-17).

Accordingly, reconsideration and withdrawal of the rejection of claims 1-8 under 35 U.S.C. §102(b) based on Akiyama are respectfully requested.

IV. Claim Rejections – 35 U.S.C. §103(a)

Claim 8 was rejected under 35 U.S.C. §103(a) based on Akiyama in view of Hoshiya *et al.* (U.S. Pat. No. 5,933,297) (“Hoshiya”). The rejection is respectfully traversed.

Claim 8 depends from claim 1 and is patentable for at least the same reasons provided above related to claim 1 as well as for its additional recitations.

Moreover, Hoshiya fails to remedy the deficiency of Akiyama. Hoshiya discloses a magnetic storage system/read system that includes a read medium for magnetically storing a signal and a magnetoresistive element which is driven relative to the recording medium. (See col. 1, lines 37-45). Hoshiya also discloses that the magnetoresistive element of the present invention is utilized to detect a signal on the recording medium and simultaneously to non-linearly convert the signal into a rectangular wave signal and to directly output it as a digital signal. (See col. 10, lines 41-45).

Hoshiya is, however, silent about, *inter alia*, a giant magnetoresistive element configured to have a linear magnetic field response characteristic, in response to a reproduction magnetic field from the disk medium, to output a signal waveform without distortion. Therefore, any reasonable combination of Akiyama and Hoshiya does not, in any way, result in the invention of claim 8.

Applicant notes that in Hoshiya, when both the disk medium having the soft magnetic layer and the GMR element are combined, a reproduction signal magnetic flux flows markedly from the disk medium into the GMR element. Consequently, a signal waveform having a non-linear distortion is output from the GMR element (as explained in pages 2-4 of the specification of the present application, in which the system disclosed by Hoshiya is discussed).

By contrast, claim 8 includes the limitation of claim 1 that recites that the giant magnetoresistive (GMR) element is configured to output a signal waveform without distortion. That is, the signal waveform is generated when the magnetic flux flows into the GMR element after the intense magnetic flux is generated from the disk medium having the soft magnetic layer.

Accordingly, reconsideration and withdrawal of the rejection of claim 8 under 35 U.S.C. §103(a) based on Akiyama in view of Hoshiya are respectfully requested.

V. Conclusion

All matters having been addressed, Applicant respectfully requests the entry of this Amendment, the Examiner's reconsideration of this application, and the immediate allowance of pending claims 1-8. Applicant's Counsel remains ready to assist the Examiner in any way to facilitate and expedite the prosecution of this matter.

Please charge any fees associated with the submission of this paper to Deposit Account Number 033975. The Commissioner for Patents is also authorized to credit any over payments to the above-referenced Deposit Account.

Respectfully submitted,

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